| Notice of Allowability | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/501,228 | ONOI ET AL. | |
| | Examiner | Art Unit | |
| | Ling-Siu Choi | 1713 | |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--***

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the Amendment filed 08/09/2005*.

2. ☐ The allowed claim(s) is/are *1,3-5 and 7*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   **Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

## DETAILED ACTION

1. This Office Action is in response to the Amendment filed August 9, 2005. Claim 2 was canceled and claim 7 has been added. Claims 1 and 3-7 are now pending.

### *Examiner's Amendment*

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CAR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Lee Cheng on September 2, 2005.

3. The application has been amended as follows:

**Cancel claim 6 without prejudice.**

### *Allowable Subject Matter*

4. Claims 1, 3-5, and 7 are allowed.

5. The following is an examiner's statement of reasons for allowance:

The present claims are allowable over the closest reference: Ashiura et al. (US 6,653,409 B2), Bertin et al. (US 2003/0139536 A1), Masayoshi et al. (JP 10182881 A), Veregin et al. (US 5,610,250), and Onoi et al. (JP 2000212329 A).

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|---|
| A process to produce a modified polymer, comprising |
| generating a carbon radical in the molecule of a polymer to be modified by at least one means for generating a carbon radical selected from the group consisting of **a radical initiator, electron beam, light, and radiation** and |
| reacting the polymer having the carbon radical generated above with a **compound having the mono-nitroxide free radical stable** at an ordinary temperature in the presence of oxygen |

(summary of claim 1)

Ashiura et al. disclose a process to prepare a radical-modified polymer, the process comprising (a) compounding TEMPO or other compounds having stable free radicals into a rubber composition, (b) forming carbon radicals at the ends of the molecules or in the molecular chains of the rubber by **shearing** during the processing of the rubber, and (c) trapping the stable free radicals to the resulting carbon radicals to form the radical-modified polymer, wherein TEMPO can be thiirane-TEMPO, isocyanate-TEMPO, epoxy-TEMPO, or imine-TEMPO (abstract; col. 2, lines 34-45; col. 4, lines 50-53). However, Ashiura et al. do not teach or fairly suggest a process comprising generating a carbon radical by a mean selected from the group consisting of **a radical initiator, electron beam, light**, and **radiation**.

Bertin et al. disclose a process to prepare a radical-modified polymer, the process comprising treating a polymer in the presence of a **multinitroxide** and a free radical initiator, wherein proton is extracted from the polymer and the nitroxide functional groups of the

multifunctional nitroxide are grafted to the resulting polymer to form a thermoreversible bonds between the polymer and the oxygen atoms of the nitroxide functional groups (abstract; [0032]-[0034]; claim 1). However, Bertin et al. do not teach or fairly suggest a process comprising the contact of **mono nitroxide** with the generated carbon radical.

Masayoshi et al. disclose a process to prepare a rubber composition, the process comprising compounding 100 parts by weight of a diene rubber with 0.1-10 parts by weight of a compound containing at least one kind of free radical selected from nitroxyl, hydrazyl, and trityl free radicals, which is stable at normal temperature in the presence of **oxygen** (abstract). However, Masayoshi et al. do not teach or fairly suggest a process comprising generating a carbon radical by a mean selected from the group consisting of **a radical initiator**, **electron beam**, **light**, and **radiation**.

Veregin et al. disclose a process to prepare a radical-modified polymer, the process comprising heating a mixture of a free radical initiator, a stable free radical agent, and at least one polymerizable monomer compound, wherein the stable free radical agent can be TEMPO or PROXYL (abstract; Table 1). However, Veregin et al. do not teach or fairly suggest the process: (a) **generating a carbon radical in a polymer** by a radical initiator, electron beam, light, or radiation and (b) **reacting the resulting polymer with a compound having the mono-nitroxide** free radical stable at an ordinary temperature in the presence of oxygen.

Onoi et al. disclose a process to prepare a composition, the process comprising contacting a diene-based rubber with a compound containing nitroxy or trityl radical in the presence of oxygen (abstract). However, Onoi et al. do not teach or fairly suggest a process comprising generating a carbon radical by a mean selected from the group consisting of **a radical initiator**,

**electron beam, light**, and **radiation**.

In light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.

**LING-SUI CHOI**
**PRIMARY EXAMINER**

September 2, 2005